

## 2-4 Writing Linear Equations

Forms

$$Ax + By = C \quad \text{standard form}$$

$$y = mx + b \quad \text{slope-intercept form}$$

$$y - y_1 = m(x - x_1) \quad \text{point-slope form}$$

Find the equation of a line passing through the given point, with the given slope. (in slope-intercept form)

$(-3, -6)$   
 $m = 2$

$$y = mx + b$$

$$y = 2x + b$$

$$-6 = 2(-3) + b$$

$$0 = b$$

$$y = 2x$$

Find the equation of a line passing through the given points. (In slope-intercept form)

$(6, -3)$   $(8, -9)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-9 - (-3)}{8 - 6} = \frac{-6}{2} = -3$$

$$y = mx + b$$

$$y = -3x + b$$

$$-3 = -3(6) + b$$

$$15 = b$$

$$y = -3x + 15$$

Find the equation of a line passing through the given points. (In point-slope form)

$(.5, 7)$   $(-.5, 4)$

$$m = \frac{7 - 4}{.5 - (-.5)} = 3$$

$$y - y_1 = m(x - x_1)$$

$$y - 7 = 3(x - \frac{1}{2})$$

Write the equation of a line  $\perp$  to  $2x + y = 5$  and passing through  $(1, -7)$ .

$$\frac{1}{m} = \frac{1}{2} \quad 2x + y = 5$$

$$y = mx + b \quad y = -2x + 5$$

$$-7 = \frac{1}{2}(1) + b \quad m = -2$$

$$-7\frac{1}{2} = b$$

$$y = \frac{1}{2}x - 7\frac{1}{2}$$

Write the equation of a line  $\parallel$  to  $3y - x = 4$  and passing through  $(3, 10)$ .

$$m = \frac{1}{3} \quad 3y - x = 4$$

$$y = \frac{1}{3}x + b \quad 3y = x + 4$$

$$10 = \frac{1}{3}(3) + b \quad y = \frac{1}{3}x + \frac{4}{3}$$

$$9 = b$$

$$y = \frac{1}{3}x + 9$$

Std Form

$$\frac{1}{3}x - y = -9$$

$$x - 3y = -27$$

Write the equation of a line  $\perp$  to the line containing  $(4, 3)$  and  $(4, 8)$  and passing through  $(2, -9)$ .

$$m = \frac{8-3}{4-4} = \frac{5}{0}$$

undefined

vertical

$$x = 4$$

horizontal

$$y = -9$$

$$y = mx + b$$

Linear variation

y varies linearly as x (y depends on x)

$$y = mx + b$$

(independent variable, dependent variable)

1. The present population of Whitehall is 47,000. The population increases by 550 each year. Express the population (P) in (t) years. Use the function to find the population in 30 years. In 38 years.

$$P = mt + b$$

$$P = 550t + 47000$$

$$30 \text{ yrs} \quad 63,500$$

$$38 \text{ yrs} \quad 67,900$$

2. A telephone company charges \$12 per month plus \$ .10 for each local call. Express the monthly bill (B) in terms of the number of calls (c). What would the bill be if there were 47 local phone calls?

$$B = mc + b$$

$$B = .10c + 12$$

$$47$$

$$\$16.70$$

3. A ranger calculates there are 6,000 deer in a preserve. She also estimates that 75 more deer die than are born each year. How many deer will be in the preserve in x years? In how many years will the preserve be empty?

$$D = -75x + 6000$$

HW p78-79

#s 13, 14, 17-19, 21, 29-35 odd,

36, 38

and complete word problems